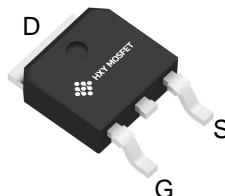




## Description

The HXY100N02D uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



**TO-252-2L**

## General Features

$V_{DS} = 20V$   $I_D = 100A$

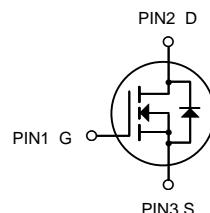
$R_{DS(ON)} < 4m\Omega$  @  $V_{GS} = 4.5V$

## Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HXY100N02D	TO-252-2L	100N02 XXX YYYY	2500

## Absolute Maximum Ratings ( $T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current-Continuous	100	A
$I_D (100^\circ C)$	Drain Current-Continuous( $T_c=100^\circ C$ )	59	A
$I_{DM}$	Pulsed Drain Current	360	A
$P_D$	Maximum Power Dissipation	88	W
$E_{AS}$	Single pulse avalanche energy	118	mJ
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{eJC}$	Thermal Resistance,Junction-to-Case	1.8	°C/W



**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(\text{BR})\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}$ , $I_D=250\mu\text{A}$	20	-	-	V
$I_{\text{DSS}}$	Zero Gate Voltage Drain Current	$V_{\text{DS}}=20\text{V}$ , $V_{\text{GS}}=0\text{V}$	-	-	1	$\mu\text{A}$
$I_{\text{GSS}}$	Gate to Body Leakage Current	$V_{\text{GS}}= \pm 12\text{V}$ , $V_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}$ , $I_D=250\mu\text{A}$	0.4	0.7	1.0	V
$R_{\text{DS}(\text{on})}$	Static Drain-Source On-Resistance note3	$V_{\text{GS}}=4.5\text{V}$ , $I_D=30\text{A}$	-	2.8	4	$\text{m}\Omega$
		$V_{\text{GS}}=2.5\text{V}$ , $I_D=20\text{A}$		4	6	
<b>Dynamic Characteristics</b>						
$C_{\text{iss}}$	Input Capacitance	$V_{\text{DS}}=10\text{V}$ , $V_{\text{GS}}=0\text{V}$ , $f=1.0\text{MHz}$	-	3200	-	pF
$C_{\text{oss}}$	Output Capacitance		-	460	-	pF
$C_{\text{rss}}$	Reverse Transfer Capacitance		-	445	-	pF
$Q_g$	Total Gate Charge	$V_{\text{DS}}=10\text{V}$ , $I_D=30\text{A}$ , $V_{\text{GS}}=4.5\text{V}$	-	48	-	nC
$Q_{\text{gs}}$	Gate-Source Charge		-	3.6	-	nC
$Q_{\text{gd}}$	Gate-Drain("Miller") Charge		-	19	-	nC
<b>Switching Characteristics</b>						
$t_{\text{d}(\text{on})}$	Turn-On Delay Time	$V_{\text{DS}}=10\text{V}$ , $I_D=30\text{A}$ , $R_G=1.8\Omega$ , $V_{\text{GS}}=4.5\text{V}$	-	9.7	-	ns
$t_r$	Turn-On Rise Time		-	37	-	ns
$t_{\text{d}(\text{off})}$	Turn-Off Delay Time		-	63	-	ns
$t_f$	Turn-Off Fall Time		-	52	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	100	A
$I_{\text{SM}}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	360	A
$V_{\text{SD}}$	Drain to Source Diode Forward Voltage	$V_{\text{GS}}=0\text{V}$ , $I_{\text{SD}}=30\text{A}$ , $T_J=25^\circ\text{C}$	-	-	1.2	V
$t_{\text{rr}}$	Reverse Recovery Time	$T_J=25^\circ\text{C}$ , $I_F=30\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$	-	23	-	ns
$Q_{\text{rr}}$	Reverse Recovery Charge		-	10	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

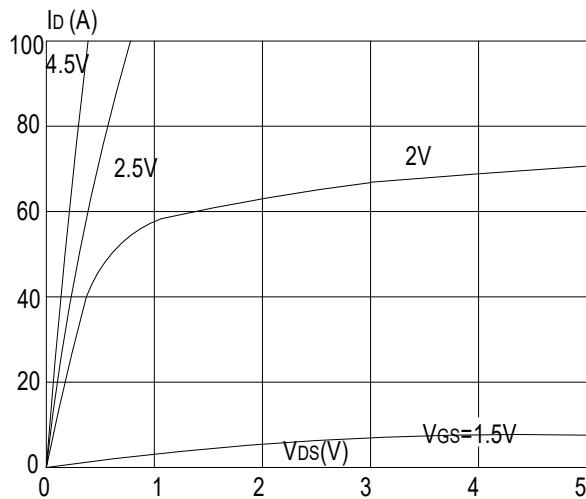
2. EAS condition:  $T_J=25^\circ\text{C}$ ,  $V_{\text{DD}}=15\text{V}$ ,  $V_G=4.5\text{V}$ ,  $R_G=25\Omega$ ,  $L=0.5\text{mH}$ ,  $I_{\text{AS}}=21\text{A}$

3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 0.5\%$

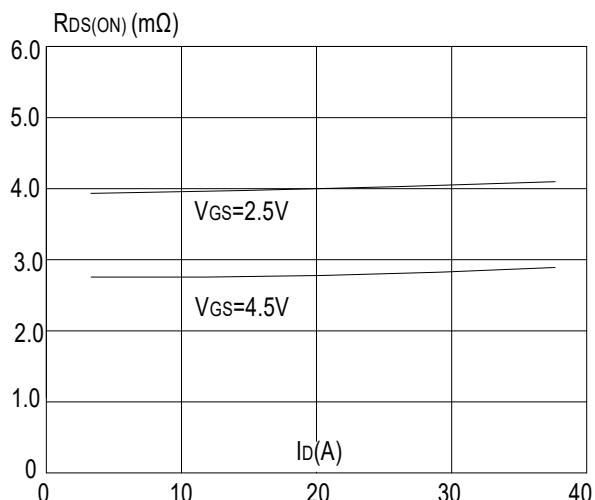


## Typical Performance Characteristics

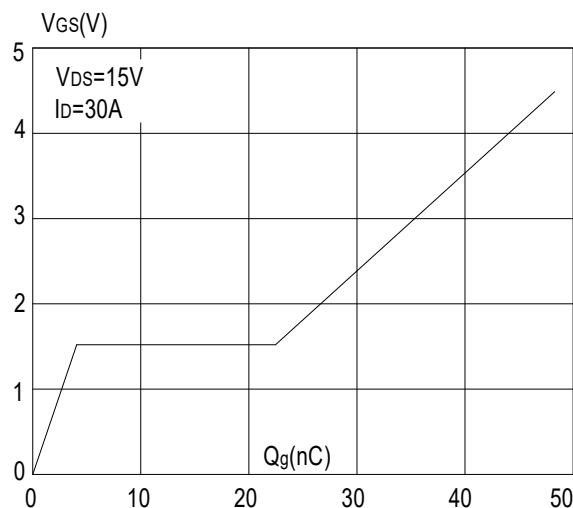
**Figure 1:** Output Characteristics



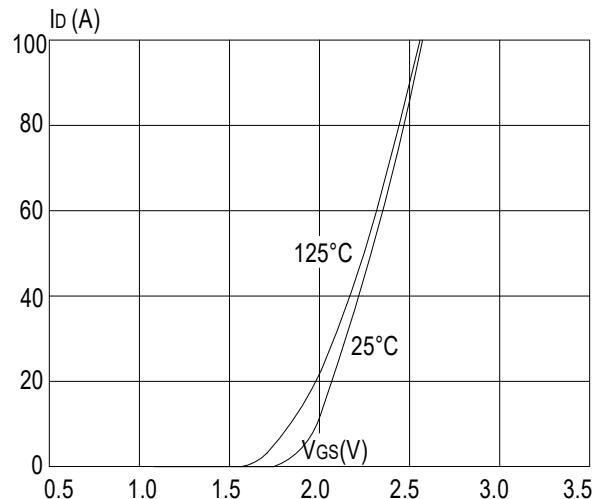
**Figure 3:** On-resistance vs. Drain Current



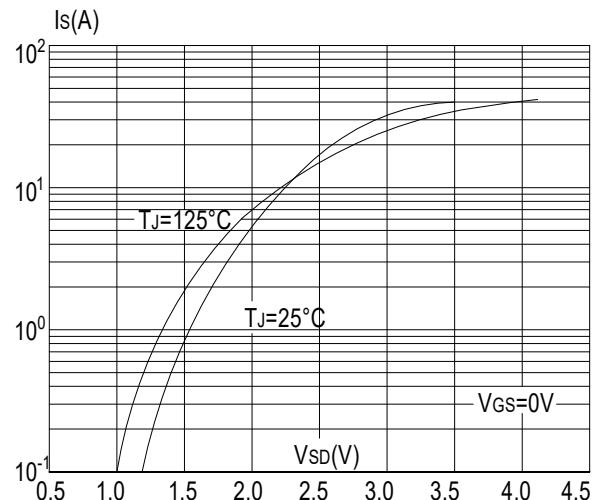
**Figure 5: Gate Charge Characteristics**



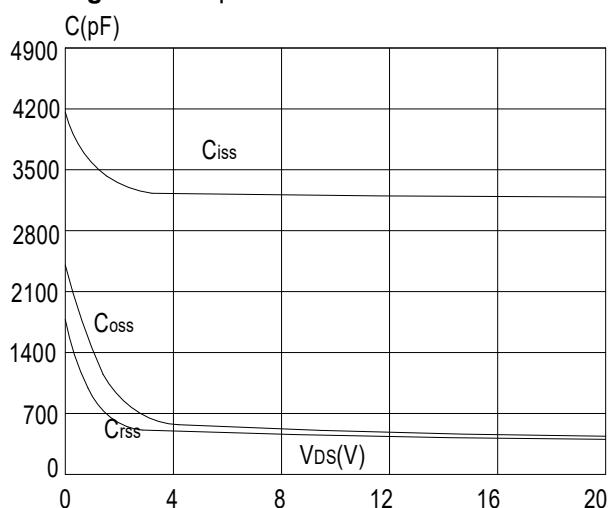
**Figure 2:** Typical Transfer Characteristics



**Figure 4:** Body Diode Characteristics

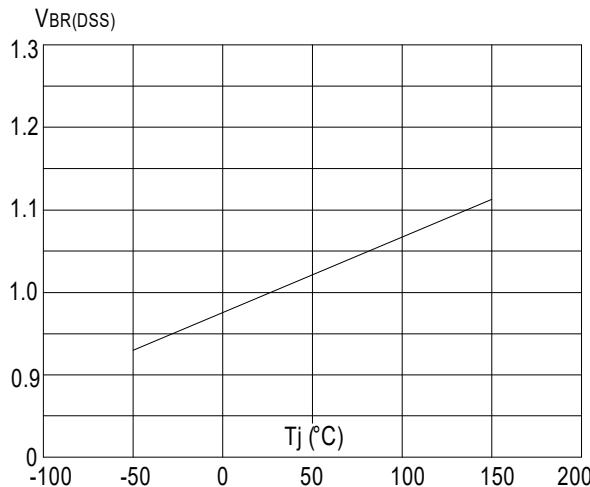


**Figure 6: Capacitance Characteristics**

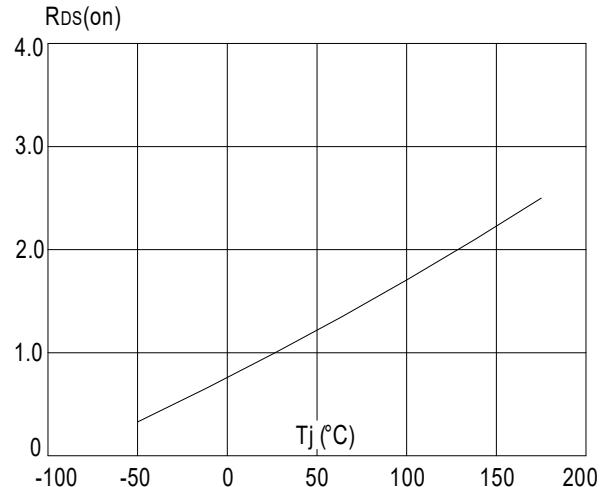




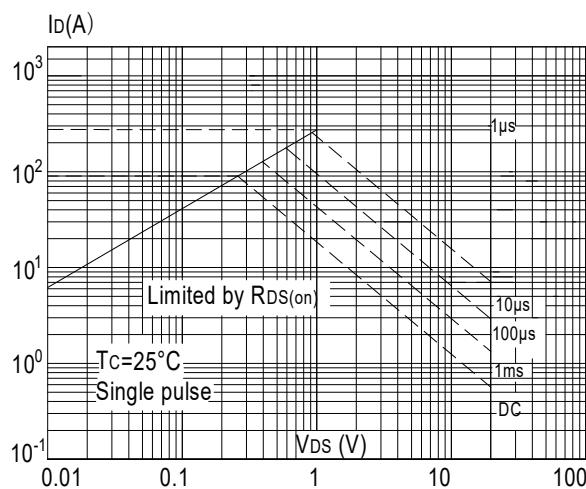
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



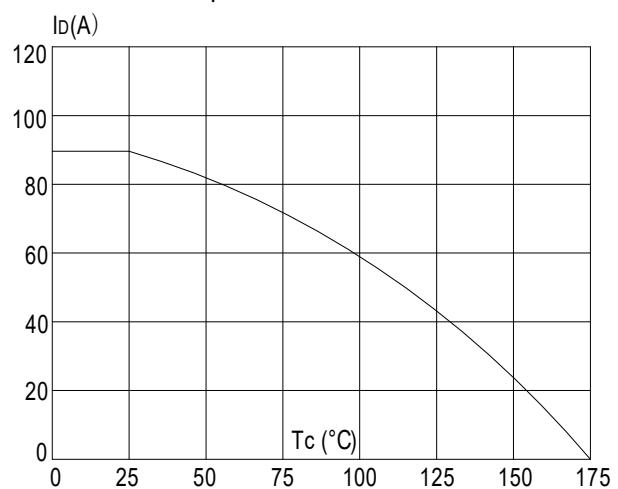
**Figure 8:** Normalized on Resistance vs. Junction Temperature



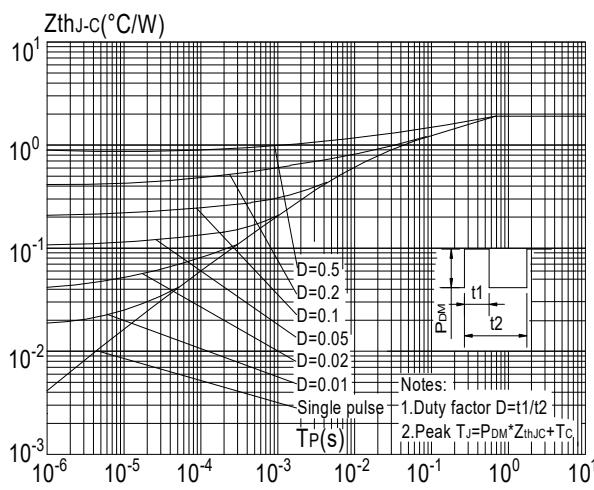
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

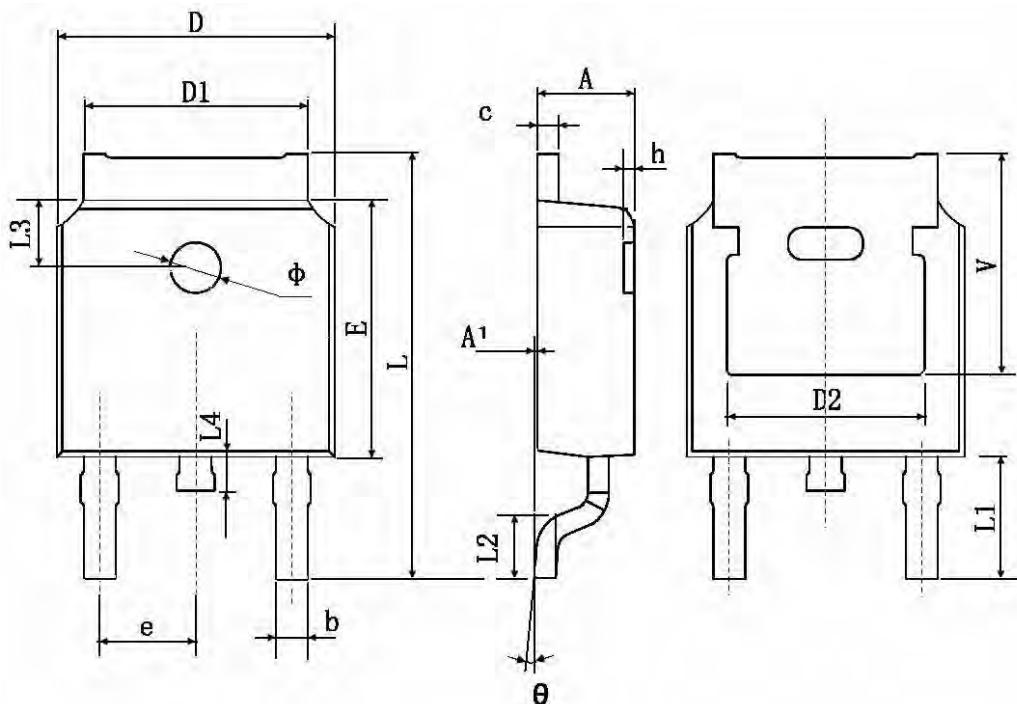


**Figure 11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case





## TO252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



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